Geophysical Research Abstracts,
Vol. 11, EGU2009-3217, 2009
EGU General Assembly 2009

Improvement of Cold Season Land Precipitation Retrievals through the use of Field Campaign Data and High Frequency Microwave Radiative Transfer Model

N-Y wang (1) and R ferraro (2)

(1) University of Maryland, College Park, Maryland, (2) NOAA/NESDIS

As we move from the TRMM to GPM era, more emphasis will be placed on a larger regime of precipitation in mid- and high-latitudes, including light rain, mixed-phase precipitation and snowfall. In these areas, a large and highly variable portion of the total annual precipitation is snow. The remote sensing of snowfall is especially challenging because of several factors (1) the lack of liquid precipitation in the snowfall limits the passive microwave retrieval to the scattering signals at the high frequency, which is indirectly associated with surface precipitation (2) The optical properties of frozen hydrometeor is more variable and less well known than those of rain (3) The surface emissivity of snow is highly variable in time and space, which further hampers the uses of the window channels. There is a wealth of observational evidence of brightness temperature depression from frozen hydrometeor scattering at the high frequency from aircraft and spacecraft microwave instruments. Research on the development of snowfall retrieval over land has become increasing important in the last few years (Chen and Staelin, 2003; Kongoli et al., 2004; Skofronick-Jackson et al., 2004). However, there is still a considerable amount of work that needs to be done to develop global snowfall detection and retrieval algorithms. This paper describes the development and testing of snowfall models and retrieval algorithms using pre-launch GPM field campaign data (e.g., CV3P) and high frequency radiative transfer models.